

AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remains under examination in the application are presented beginning on the following page. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough for six or more characters and double brackets for five or less characters; and 2. added matter is shown by underlining.

1. (Currently Amended) A method for two-level variable chip rate spreading and despreading in a CDMA (Code Division Multiple Access) system, the method comprising:

at a transmitting side, applying first level spreading to data information with a first level spreading code to produce a first level-spread signal, wherein the first level spreading code produces a first spreading factor of a chips per symbol interval of the data information, and applying second level spreading to the first level-spread signal with a second level spreading code to produce a second level-spread signal, wherein the second level spreading code produces a second spreading factor of b chips per each chip interval of the first level spreading code, wherein b is more than 1, such that a total spreading factor for producing the second level-spread signal is equal to a product of the first spreading factor and the second spreading factor; and

at a receiving side, first despreading the second level-spread signal, including integrating with a first interval of substantially a chip width of the first level-spread signal, then despreading the first level-spread signal, including integrating with a second interval of substantially a width of an information bit of the data information.

2. (Previously Presented) The method for two-level variable chip rate spreading and despreading in the CDMA system according to claim 1, wherein the first spreading gain is equal to the length of the first level spreading code, the second spreading gain is equal to a length of the second spreading code.

3. (Original) The method for two-level variable chip rate spreading and despreading in CDMA system according to claim 1, wherein in a system which the transmitters of respective base stations are quasi-synchronized, said method applying to the downlinks in CDMA system, said first level spreading code being used as a common code for all users in the same cell to distinguish users of different cells, said second level spreading code being used as the channel codes for each of the users of the cell to distinguish different users of the same cell.
4. (Original) The method for two-level variable chip rate spreading and despreading in CDMA system according to claim 1, wherein said method applying to the uplinks of the quasi-synchronized CDMA system, said first level spreading code being used as the common codes for all users in the same cell to distinguish users of different cells, said second level spreading code being used as the channel codes for each of the users of the cell to distinguish different users of the same cell.
5. (Original) The method for two-level variable chip rate spreading and despreading in CDMA system according to claims 1, 3 or 4, wherein ZCZ sequence which the zero correlation zone Z is 1 being used as the common codes, ZCZ sequence having the corresponding zero correlation zone being used as the channel codes, and said receiver despreading the common codes and the channel codes respectively.

6. (Original) The method for two-level variable chip rate spreading and despreading in CDMA system according to claims 1, 3 or 4, wherein Walsh sequence being used as the common codes, ZCZ sequence having the corresponding zero correlation zone being used as the channel codes, and said receiver despreading the common codes and the channel codes respectively.
7. (Original) The method for two-level variable chip rate spreading and despreading in CDMA system according to claims 1, 3 or 4, wherein ZCZ sequence which the zero correlation zone Z is 1 being used as the common codes, the orthogonal sequence being used as the channel codes, and said receiver despreading the common codes and the channel codes respectively.
8. (Original) The method for two-level variable chip rate spreading and despreading in CDMA system according to claims 1, 3 or 4, wherein PN (pseudo-random) sequence being used as the common codes, and ZCZ sequence having the corresponding zero correlation zone being used as the channel codes, and said receiver despreading the common codes and the channel codes respectively.
9. (Previously Presented) The method for two-level variable chip rate spreading and despreading in the CDMA system according to claim 1, further comprising the step of dynamically varying a chip rate of at least one of the first level and the second level spreading codes.
10. (Currently Amended) A method of applying two-level spreading to an information signal in a CDMA (Code Division Multiple Access) system, wherein the information signal has a length of x symbols, the method comprising:

applying first level spreading to the information signal with a first level spreading code having a length of y symbols to produce a first level-spread signal having a length of $x \cdot y$ symbols that is greater than x ; and

applying second level spreading to the first level-spread signal with a second level spreading code having a length of z symbols to produce a second level-spread signal having a length of $x \cdot y \cdot z$ symbols that is greater than $x \cdot y$.

11. (Previously Presented) The method of claim 10, wherein at least one of the steps of applying the first level spreading and applying the second level spreading includes varying at least one of the lengths y or z dynamically.

12. (Currently Amended) A method of applying two-level spreading to an information signal in a CDMA (Code Division Multiple Access) system, wherein the information signal has a symbol bit rate, the method comprising:

applying first level spreading to the information signal with a first level spreading code used to distinguish different cells, the first level spreading code having a first chip rate equal to the symbol rate times a first level spreading factor to produce a first level-spread signal having a second chip first output symbol rate equal to a product of the bit rate and the first chip rate; and

applying second level spreading to further spread the first level-spread signal with a second level spreading code used to distinguish channels within a cell, the second level spreading code having a third-second chip rate equal to the first chip rate times a second level spreading factor to produce a second level-spread signal having a chip second-output symbol rate equal to a product of the second chip rate and a spreading factor equal to a product of the first level spreading factor and the second level spreading factor and the third chip rate;

wherein the first level spreading factor is equal to a length of the first level spreading code, and the second level spreading factor is equal to a length of the second level spreading code.

13. (Previously Presented) The method of claim 12, wherein at least one of the steps of applying the first level spreading and applying the second level spreading includes varying at least one of the first and third chip rates.